

## **ABSTRACT**

A surgical instrument navigation system comprises an ultrasound machine and a computer coupled to the ultrasound machine. A memory is coupled to the computer and includes computer instructions that when executed by the computer cause the computer to generate an icon representing the surgical instrument with a tip and the surgical instrument's trajectory and to overlay the icon on a real-time ultrasound image having an image plane, such that when the surgical instrument crosses the ultrasound image plane the format of the surgical instrument's trajectory is changed to represent the surgical instrument's crossing of the ultrasound image's plane. The system also comprises a localizer coupled to the ultrasound machine, and a display coupled to the computer for displaying the generated icon superimposed on the real-time image.